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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,103	10/05/2004	Tetsuo Uozumi	040302-0408	5072
22428	7590	04/28/2008	EXAMINER	
FOLEY AND LARDNER LLP			BEST, ZACHARY P	
SUITE 500			ART UNIT	
3000 K STREET NW			PAPER NUMBER	
WASHINGTON, DC 20007			4191	
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			04/28/2008	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/510,103	UOZUMI, TETSUO	
	<b>Examiner</b>	<b>Art Unit</b>	
	Zachary Best	4191	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1)  Responsive to communication(s) filed on 08 April 2008.
- 2a)  This action is **FINAL**.
- 2b)  This action is non-final.
- 3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4)  Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 11-19,21 and 23 is/are withdrawn from consideration.
- 5)  Claim(s) \_\_\_\_\_ is/are allowed.
- 6)  Claim(s) 1,2,7,9,10,20 and 22 is/are rejected.
- 7)  Claim(s) 3-6 and 8 is/are objected to.
- 8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9)  The specification is objected to by the Examiner.
- 10)  The drawing(s) filed on 05 October 2004 is/are: a)  accepted or b)  objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All    b)  Some \*    c)  None of:
- 1.  Certified copies of the priority documents have been received.
- 2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
- 3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1)  Notice of References Cited (PTO-892)
- 2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3)  Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 10052004, 01032005, 05302006, 08222006, 05022007.
- 4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5)  Notice of Informal Patent Application
- 6)  Other: \_\_\_\_\_



**FUEL CELL SYSTEM**

Examiner: Z. Best    S.N. 10/510,103    Art Unit: 4191    April 25, 2008

***Election/Restrictions***

1. Election of Group I, Claims 1-10, 20, and 22 filed on April 8, 2008 has been received. Claims 11-19, 21, and 23 are non-elected.

***Specification***

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 22 is rejected under 35 U.S.C. 102(b) as being anticipated by Saito et al. (U.S. Pre-Grant Pub. 2002/0022171 A1).

Regarding Claim 22, Saito et al. teach a method of controlling a fuel cell system comprising preparing a fuel cell (11), preparing a hydrogen supply source supplying hydrogen to the fuel cell (H2), preparing ejectors disposed between the fuel cell and the

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hydrogen supply source (30), supplying hydrogen to the fuel cell for electric power generation (par. 77 and 81), expelling excess hydrogen from the fuel cell as a result of non-use for the electric power generation (par. 37), and selectively shutting off the plurality of ejectors depending on a demanded parameter to allow the excess hydrogen, expelled from the fuel cell, to be recirculated thereto through at least selected one of the plurality of ejectors (fig. 3-4, and par. 41).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-2, 7, 9-10, 20, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. (U.S. Pre-Grant Publication 2002/0022171 A1), in view of Sahoda et al (U.S. Patent No. 6,706,438 B2).

Regarding Claim 1, Saito et al. teach a fuel cell system comprising a fuel cell (11), a hydrogen supply source supplying hydrogen to the fuel cell (H2), ejectors disposed between the fuel cell and the hydrogen supply source (30), and permitting excess hydrogen, expelled from the fuel cell, among hydrogen supplied to the fuel cell from the hydrogen supply source to be recirculated to the fuel cell (fig. 1), and a shut-off mechanism selectively

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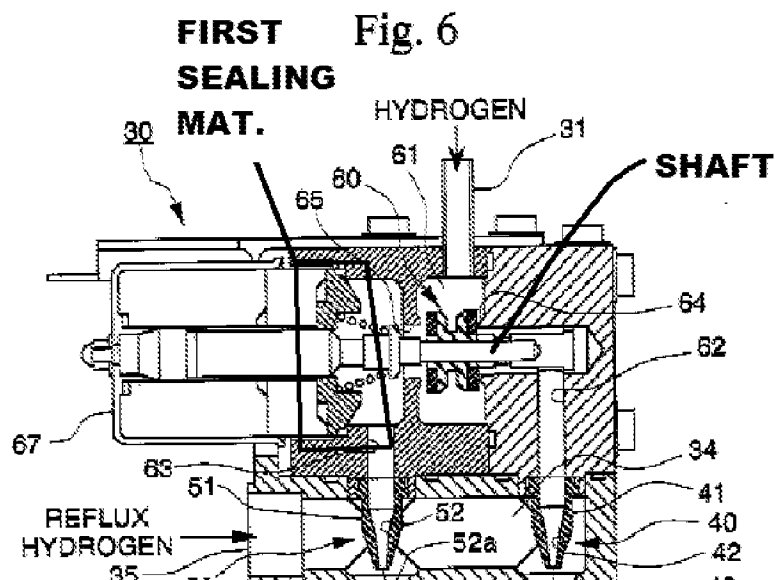
shutting off hydrogen communicating through at least one of the ejectors (67). However, Saito et al. fail to teach said fuel cell system comprising more than three ejectors.

Sahoda et al. teach a fuel cell system comprising a fuel cell (11), a hydrogen supply source (H<sub>2</sub>), and three or four ejectors (col. 2, lines 47-56). It is advantageous to use three or four ejectors in the fuel cell system because it improves the stoichiometry characteristics of the fuel cell system (col. 2, lines 47-56). Therefore, it would have been advantageous to one having ordinary skill in the art at the time the invention was made to create the fuel cell system of Saito et al. with four ejectors because Sahoda et al. teach that using four ejectors will improve the stoichiometry characteristics of the fuel cell system.

Regarding Claim 2, Saito et al. teach that each of the ejectors comprises a housing (33) formed with a hydrogen inlet port (31), a hydrogen outlet port (32), and a hydrogen recirculation port (35), and a valve body moveably received in the housing and incorporating a plurality of ejector sections (60, 62, and 63), wherein movement of the valve body allows either one of the plural ejector sections to be selected (par. 41).

Regarding Claim 7, Sahoda et al. teach a diffuser (131) commonly used for the plurality of ejectors (fig. 9).

Regarding Claim 9, Saito et al. teach a shaft having one end connected to the valve body (see fig. 6), an actuator (67) connected to the other end of the shaft to an outside of the housing (33), a first sealing material disposed between the shaft and the housing (see fig. 6), and second sealing materials disposed at respective contacting peripheries between the hydrogen inlet port, the hydrogen outlet port, and the valve body (60).



Regarding Claim 10, Saito et al. teach sealing materials disposed at the contacting peripheries of the ejector (see fig. 6, and element 60). It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a sealing material disposed at the contacting peripheries between the hydrogen inlet, hydrogen outlet, and hydrogen circulation ports and the valve body because it would improve the resistance to leakage.

Regarding Claim 20, Saito et al. teach a fuel cell system comprising a fuel cell (11), a hydrogen supply source supplying hydrogen to the fuel cell (H<sub>2</sub>), ejectors disposed between the fuel cell and the hydrogen supply source (30), and permitting excess hydrogen, expelled from the fuel cell, among hydrogen supplied to the fuel cell from the hydrogen supply source to be recirculated to the fuel cell (fig. 1), and a shut-off mechanism selectively

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shutting off hydrogen communicating through at least one of the ejectors (67). However, Saito et al. fail to teach said fuel cell system comprising more than three ejectors.

Sahoda et al. teach a fuel cell system comprising a fuel cell (11), a hydrogen supply source (H<sub>2</sub>), and three or four ejectors (col. 2, lines 47-56). It is advantageous to use three or four ejectors in the fuel cell system because it improves the stoichiometry characteristics of the fuel cell system (col. 2, lines 47-56). Therefore, it would have been advantageous to one having ordinary skill in the art at the time the invention was made to create the fuel cell system of Saito et al. with four ejectors because Sahoda et al. teach that using four ejectors will improve the stoichiometry characteristics of the fuel cell system.

#### ***Allowable Subject Matter***

7. Claims 3-6 and 8 are objected to as being dependent upon a rejected base claim, but the Claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 3 would be allowable because the prior art of record, Saito et al. and Sahoda et al., does not disclose or suggest the valve body comprises a hydrogen recirculation flow passage communicating with the hydrogen recirculation port, wherein the valve body has a cylindrical shape and received in the housing for a sliding and moving capability along an axis of the valve body, and wherein the plural ejector sections are disposed in the valve body in communication with the hydrogen recirculation flow passage along a direction in which the valve body slides such that sliding movement of the valve body effectuated in the housing allows either one of the



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plural ejector sections to be brought into communication with the hydrogen inlet port and the hydrogen outlet port of the housing. Claim 4 would be allowable because the prior art of record, Saito et al. and Sahoda et al., does not disclose or suggest the valve body comprises a hydrogen recirculation flow passage communicating with the hydrogen recirculation port, wherein the valve body has a cylindrical shape and received in the housing for a rotationally moving capability about an axis of the valve body, and wherein the plural ejector sections are disposed in the valve body in communication with the hydrogen recirculation flow passage along a direction in which the valve body rotationally moves such that rotational movement of the valve body effectuated in the housing allows either one of the plural ejector sections to be brought into communication with the hydrogen inlet port and the hydrogen outlet port of the housing. Claim 5 would be allowable because the prior art of record, Saito et al. and Sahoda et al., does not disclose or suggest the valve body comprises a hydrogen recirculation flow passage communicating with the hydrogen recirculation port, wherein the valve body has a spherical shape and received in the housing for a rotationally moving capability about a central axis of the valve body, and wherein the plural ejector sections are disposed in the valve body in communication with the hydrogen recirculation flow passage along a direction in which the valve body rotationally moves such that rotational movement of the valve body effectuated in the housing allows either one of the plural ejector sections to be brought into communication with the hydrogen inlet port and the hydrogen outlet port of the housing. Claim 6 would be allowable because the prior art of record, Saito et al. and Sahoda et al., does not disclose or suggest the valve body

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comprises a hydrogen recirculation flow passage communicating with the hydrogen recirculation port, wherein the valve body has a cylindrical shape and received in the housing to rotationally move about an axis of the valve body while sliding along the axis thereof, and wherein the plural ejector sections are disposed in the valve body on a spiral configuration in communication with the hydrogen recirculation flow passage along a direction in which the valve body rotationally moves while in sliding movement such that rotational movement of the valve body while in sliding movement effectuated in the housing allows either one of the plural ejector sections to be brought into communication with the hydrogen inlet port and the hydrogen outlet port of the housing. Claim 8 would be allowable because the prior art of record, Saito et al. and Sahoda et al., does not disclose or suggest the valve body moveably received in the housing and incorporating a plurality of ejector sections and further comprising a shut-off portion to shut off the hydrogen inlet and the hydrogen outlet port during movement thereof.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zachary Best whose telephone number is (571) 270-3963. The examiner can normally be reached on Monday to Thursday, 7:30 - 5:00 (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

zpb

/Dah-Wei D. Yuan/  
Supervisory Patent Examiner, Art Unit 4191